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⑮ **Integrated optical waveguide device.**

⑯ An integrated optical waveguide device includes a substrate (1), and an optical waveguide which is formed in the form of projection or is formed in a trench formed in the substrate. Each optical waveguide has a first optical area (2) made of a first optical material and a second optical area (3) which is made of a second optical material and is surrounded by the first optical area. The optical waveguides are arranged on both side faces of the projection or trench.

EP 0 661 561 A3



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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US-A-5 163 118 (LORENZO ET AL.) * column 6, line 48 - column 7, line 11 * * column 7, line 39 - line 44 * * figure 5D *	1	G02B6/12 G02B6/13 G02B6/42 H04B10/00 G06F15/00 G02B6/10 G02B6/43
A	PATENT ABSTRACTS OF JAPAN vol. 15, no. 162 (P-1194) 23 April 1991 & JP-A-03 029 903 (SEIKO EPSON) * abstract *	1	
A	US-A-5 061 029 (ISHIKAWA) * column 2, line 45 - column 3, line 12 * * figure 1 *	1, 3	
A	PATENT ABSTRACTS OF JAPAN vol. 7, no. 23 (P-171) 29 January 1983 & JP-A-57 176 006 (NIHON ITA) * abstract *	1	
A	PATENT ABSTRACTS OF JAPAN vol. 9, no. 93 (P-351) 23 April 1985 & JP-A-59 220 703 (FUJITSU) * abstract *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A, D	PATENT ABSTRACTS OF JAPAN vol. 15, no. 368 (P-1253) 17 September 1991 & JP-A-03 144 514 (BROTHER) * abstract *	1, 3	G02B
A	PATENT ABSTRACTS OF JAPAN vol. 7, no. 2 (P-166) 7 January 1983 & JP-A-57 163 207 (MATSUSHITA) * abstract *	2, 11, 20	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 July 1995	Examiner Luck, W
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>A : member of the same patent family, corresponding document</p>			

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EUROPEAN SEARCH REPORT

Application Number
EP 94 30 9625

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	SOVIET JOURNAL OF QUANTUM ELECTRONICS, vol.18, no.7, July 1988, NEW YORK US pages 835 - 853 A.S SEMENOV ET AL. 'waveguide channel components for optical integrated circuits based on three-dimensional optical waveguides' * chapter 9 *	4	
A	--- PATENT ABSTRACTS OF JAPAN vol. 13, no. 240 (E-767) 6 June 1989 & JP-A-01 042 132 (HITACHI) * abstract *	20	
A	--- PATENT ABSTRACTS OF JAPAN vol. 16, no. 324 (E-1234) 15 July 1992 & JP-A-04 094 536 (FUJITSU) * abstract *	20	
A	--- WO-A-92 06394 (BRITISH TELECOMMUNICATIONS) * page 7, line 11 - line 35 * * figures 3,4 *	20	
A	--- FREQUENZ, vol.45, no.9/10, October 1991, BERLIN DE pages 245 - 252 J. MÜLLER ET AL. 'Trench Bulge Waveguides for Integrated Optical Circuits' * the whole document *	20,22	
A	--- US-A-4 835 575 (PLIHAL) * column 2, line 67 - column 3, line 42 * * column 4, line 5 - line 17 * * figures 1,5 *	22	
The present search report has been drawn up for all claims			
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